

To: Laidlaw, Tina[Laidlaw.Tina@epa.gov]
From: Blend, Jeff
Sent: Fri 12/20/2013 8:43:56 PM
Subject: Emailing: DEQ_Secondary_Score_indicators.pdf
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The message is ready to be sent with the following file or link attachments:

DEQ_Secondary_Score_indicators.pdf

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Public WWTP Affordability Process

Jeff Blend, Montana DEQ

Montana Nutrient Work Group
November 18, 2010

Under State and Federal Law, DEQ Must Consider Economics when Formulating WQ Standards

- *Montana Statute: 75-5-301(2)(a), § MCA:* The Board shall...formulate and adopt standards of water quality, giving consideration to the economics of waste treatment and prevention.

Federal Regulations (40 CFR 131.10[g])

Compliance with water quality standards is not intended to cause substantial and widespread economic and social impact

If standards are to be waived, economic impacts from meeting standards must be *both* “substantial” and “widespread”

Applies **ONLY** to treatment beyond federal technology-based regulations (i.e., national secondary-treatment standards)

Evaluating an Affordability-based Approach

— Completed First Steps

- As new WQ standards, DEQ recognized that numeric nutrient criteria would affect a very broad range of permittees
- Studies completed for DEQ (on internet at NWG site)
 - 2007 study looked at cost of different treatment technologies
 - 2006 study of which affordability methods to use



EPA's "*Interim Economic Guidance for Water Quality Standards*" (1995) was recommended as best approach

- Certain criteria must be met if WWTP is to receive variance
- Internal DEQ working group (Spring 2008); Nutrient Criteria Affordability Advisory Group (*pre-cursor to this group*)
 - Made EPA's methodology spreadsheet-enabled
 - Separate evaluation methods for public vs. private sector

MT Refinement of EPA Process

- DEQ met with the working group over much of 2008, and refined the EPA public-sector affordability evaluation process to be tailored to Montana
- EPA HQ economist praised our modifications
- Modifications include:
 - Assurance that communities with two-tiered income distributions (~50% wealthy, ~50% low-income) will be properly evaluated
 - Increased focus of secondary criteria on socioeconomic indicators (i.e., how cost will affect *individuals*)
 - Much improved and refined “widespread” evaluation
 - A solution (cost cap) if S & W impacts were demonstrated

MHI Screener: Are costs of meeting Nutrient Criteria greater than 1% MHI?

No

Done:
No
Variance
granted

Yes

Calculate average Secondary Score based on five socio-economic measures compared to Montana averages.

Substantial Matrix : Is impact Substantial?

No

Done: No
Variance
Granted

Yes

Conduct Widespread Test: Is impact likely to be widespread?

No

Yes

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Variance
Granted

Public Sector Affordability Method

Step 1: Impact must be substantial

Step 1a: Use “Municipal Preliminary Screener”

Municipal Preliminary Screener (MPS) = Mean total pollution
control cost per household / median household income
(Control cost is existing user cost + cost to meet nutrient criteria)

- MPS < 1% : Cost bearable, no further analysis needed
- MPS 1-2%: Midrange impacts
- MPS > 2%: High cost impacts; unreasonable cost for many households

Step 1b: If midrange or high cost, carry out more detailed secondary tests to confirm whether *substantial* impacts would occur on the community. If impact would be *substantial*, then carry on to *widespread* test.

Step 2: Impact must be widespread. EPA methodology not explicit; provides general guidelines

Substantial Test-Step 1a: Municipal Preliminary
Screening (MPS) = Mean total pollution
control cost per household / median household
income

(Control cost is existing user cost + cost to meet
nutrient criteria)

MHI of Anywhere, Montana: \$40,000

Existing wastewater costs: \$20/Month or \$240
per year on average: 0.6% MHI

Additional cost to meet Nutrient Criteria: \$30
per month, totals \$50/Month or \$600/year
on average: 1.5% MHI

- MPS = 1.5% MHI or midrange—move on..

Substantial Test-Step 1b: Secondary Socio-Economic Indicators for a town as developed by the NCAAG group

- Poverty Rate
- Low and Moderate Income (LMI Index)
- Unemployment Rate
- Median Household Income (MHI)
- Current local tax and fee burden
- All five measures are compared to Montana averages to reach a secondary score between 1.0 and 3.0

Secondary Tests

EPA's tests

- Bond Rating
- Net debt as % of full market value of taxable property
- Unemployment rate
- Median Household income
- Property tax revenue as % of full market value
- Property tax collection rate

MT modified tests

- Poverty Rate
- Low and Moderate Income
- Unemployment Rate
- Median Household Income
- Current local tax and fee burden

Secondary Indicators-Example

	Secondary Indicators			
Indicator	Weak*	Mid-Range**	Strong***	Score
Poverty Rate	More than 22%	10-22%	Less than 10%	2
Low to Medium Income % (LMI)	More than 62%	33-62%	Less than 33%	2
Unemployment	More than 1% above State Average (>7.2%)	State Average 2009----6.2%	More than 1% below State Average (<5.2%)	2
Median Household Income	More than 10% below State Median	State Median-- \$43,948 (2008)	More than 10% above State Median	1
Property Tax, fees and revenues	More than 3.5	3.5 to 2	Less than 2	3

* Weak is a score of 1 point, Mid Range is a score of 2 points, Strong is a score of 3 points

Sum: 10

Average: 2.0 0017975

Substantial Matrix

Assessment of Substantial Impacts Matrix

	Municipal Preliminary Screener		
	Less than 1%	1% to 2%	Greater than 2%
Secondary score			
Less than 1.5	Borderline	X	X
Between 1.5 and 2.5	\$	Borderline	X
Greater than 2.5	\$	\$	Borderline

Widespread questions

- What is the ripple effect of substantial impact on the local area?
 - Economic linkages to the area
 - Town makeup
- There exist no economic ratios for Widespread
- The analysis must define the geographic area where project costs pass through to the local economy, and:
 - Consider baseline economic health of the community/area
 - Population and economic trends
 - Evaluate how the proposed project (e.g. upgrading WWTP) will affect the socioeconomic well-being of the community
- Socioeconomic impacts evaluated by their cumulative effect
- Use of Best Professional Judgment by analyst

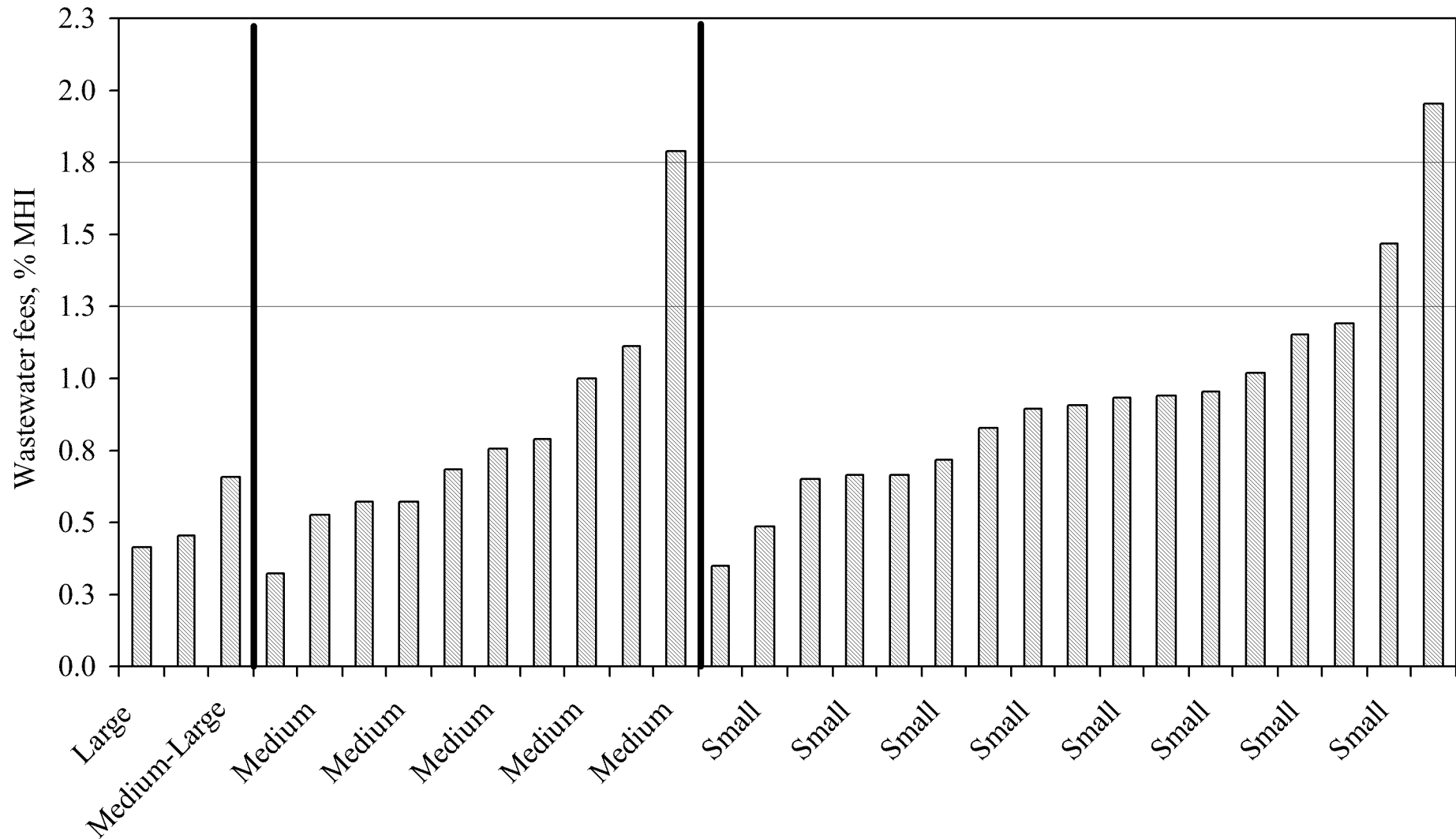
Widespread Explanation

- Affects on the following from nutrient criteria:
 - Economy in general
 - Employment
 - Housing development patterns/population
 - Disposable income
 - Quality of life including better water quality
 - If results not yet clear: Look at poverty rate, property values, municipal debt, and multiplier effects
- Best profession judgment used for widespread determination, by community's consultant & DEQ
- Data Sources: Montana Dept of Commerce/Census and Economic Information Center, local chamber of commerce, and a variety of census websites

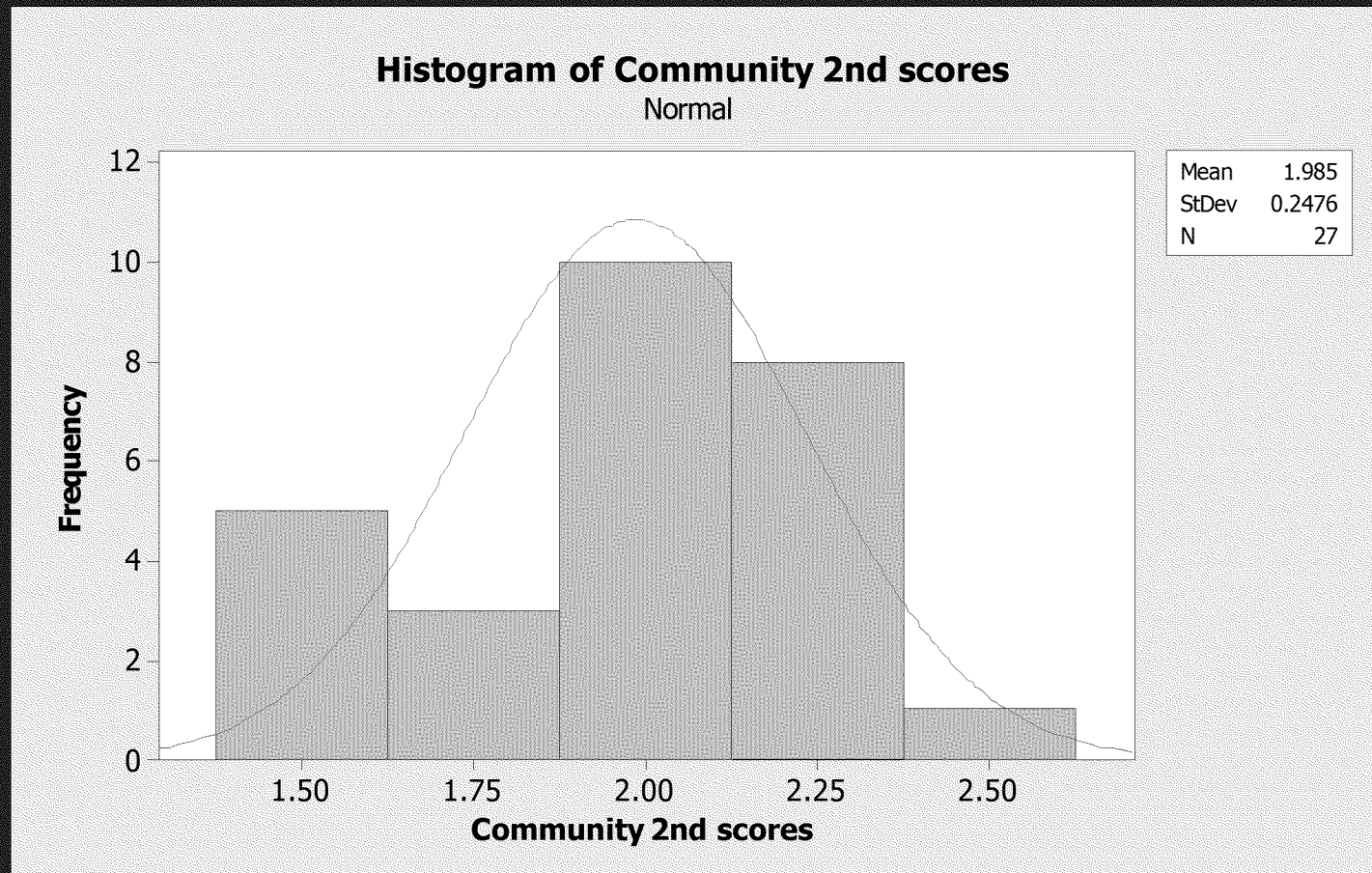
How do Montana Towns Score on the Substantial Test?

- Sampled 27 Montana towns of all sizes to see how they would score on Secondary Test
- MHI
 - The average MHI for existing waste water costs is 0.8%
 - I have assumed that every town in Montana would have to pay $> 1.0\%$ to meet nutrient criteria, so MPS would be triggered (Step 1a)
- Secondary Substantial Test (Step 1b)

Current annual wastewater costs as a % MHI in Montana communities (n=30)



Montana sample: Distribution of average Secondary Score among 27 towns



Results— “Significant Impact” finding for Sample

- The towns are a good cross section of MT communities
- Secondary scores cluster around 2.0 (mid-range)
- Most are between 1.6 and 2.2 (mid-range)
- *Assuming* that every town in Montana would incur at least 1% MHI for existing fees plus meeting nutrient standards, all but one town in our sample can argue a Significant impact and move on to Widespread

Supplementary Information

Assessment of Substantial Impacts Matrix

	Minicipal Preliminary Screener		
	Less than 1%	1% to 2%	Greater than 2%
Secondary score			
Less than 1.5	?	X	X
Between 1.5 and 2.5	\$?	X
Greater than 2.5	\$	\$?

Most towns fall here

MHI Screener: Are costs of meeting Nutrient Criteria greater than 1% MHI?

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Calculate average Secondary Score based on five socio-economic measures compared to Montana averages.

Substantial Matrix : Is impact Substantial?

No

Done: No
Variance
Granted

Yes

No

Conduct Widespread Test: Is impact likely to be widespread?

Yes

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Variance
Granted

How do Montana Towns Score on the Widespread Test?

- Most small towns (< 1000 people) are agricultural based with lagoons and will probably feel widespread impacts, although there could be exceptions (such as towns near Sidney experiencing the oil boom)--Circle
- Large towns over 10,000 will probably not feel widespread impacts--Missoula
- Medium-sized towns are harder to predict

- Havre—assume 1.8 % MHI needed to meet nutrient criteria (mechanical plant into Milk)
 - Healthy community but below average MHI
 - Diverse economy, ability to absorb unemployed
 - Low current local fees paid, 200% increase in bill
 - Widespread impact not likely—variance denied
- Fromberg—assume 4.0% MHI is needed to meet nutrient criteria (lagoon into Clarks F.)
 - Strong community but below average MHI
 - Wastewater bills increase by at least 200%
 - Disposable income impacted, no businesses
 - Widespread impacts are likely—Variance granted

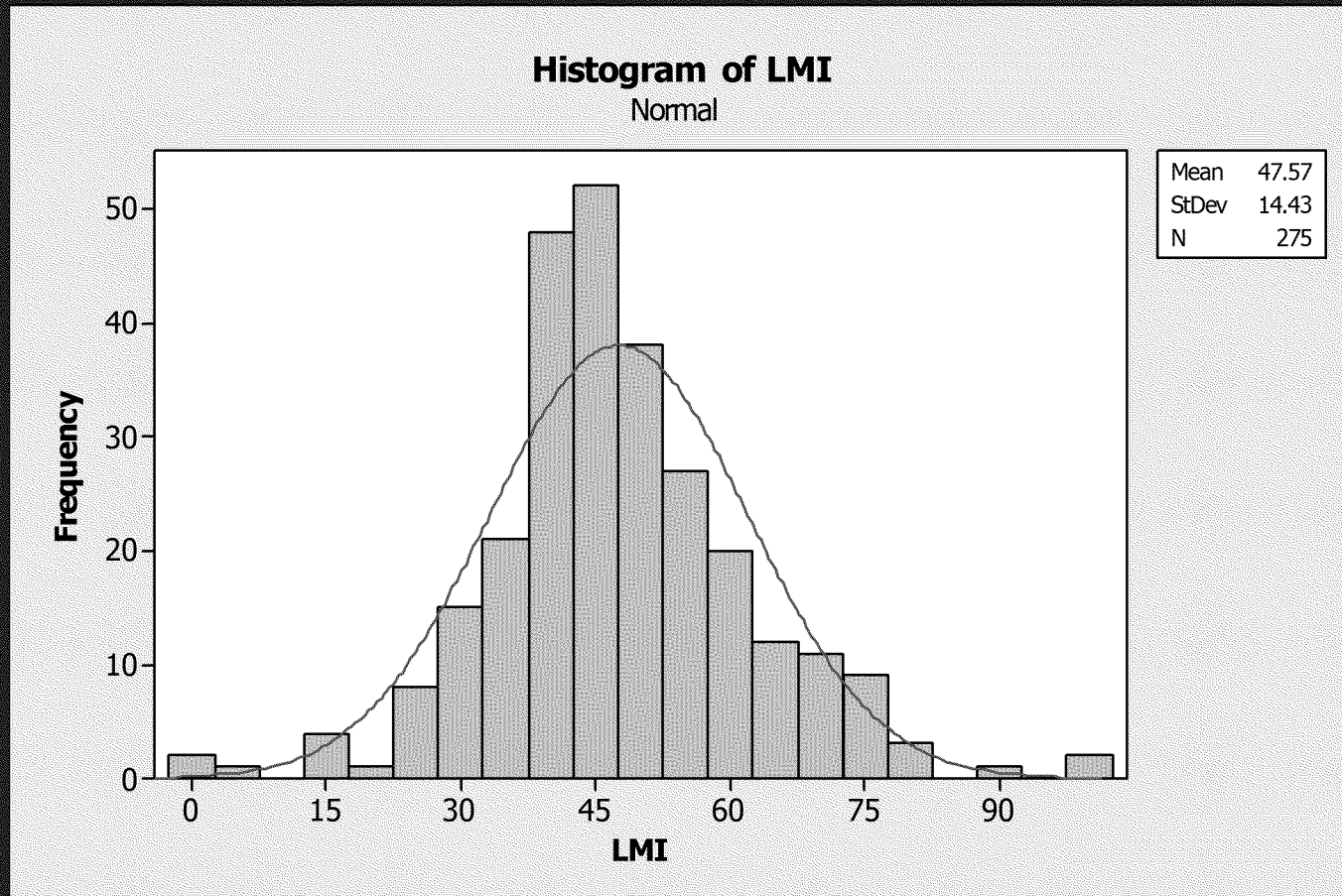
- Questions?

Wastewater Fee Survey (Jeff Blend & Paul LaVigne)

Objective: Collect a representative sample of fees Montana communities are currently paying for wastewater treatment, as a function of median household income

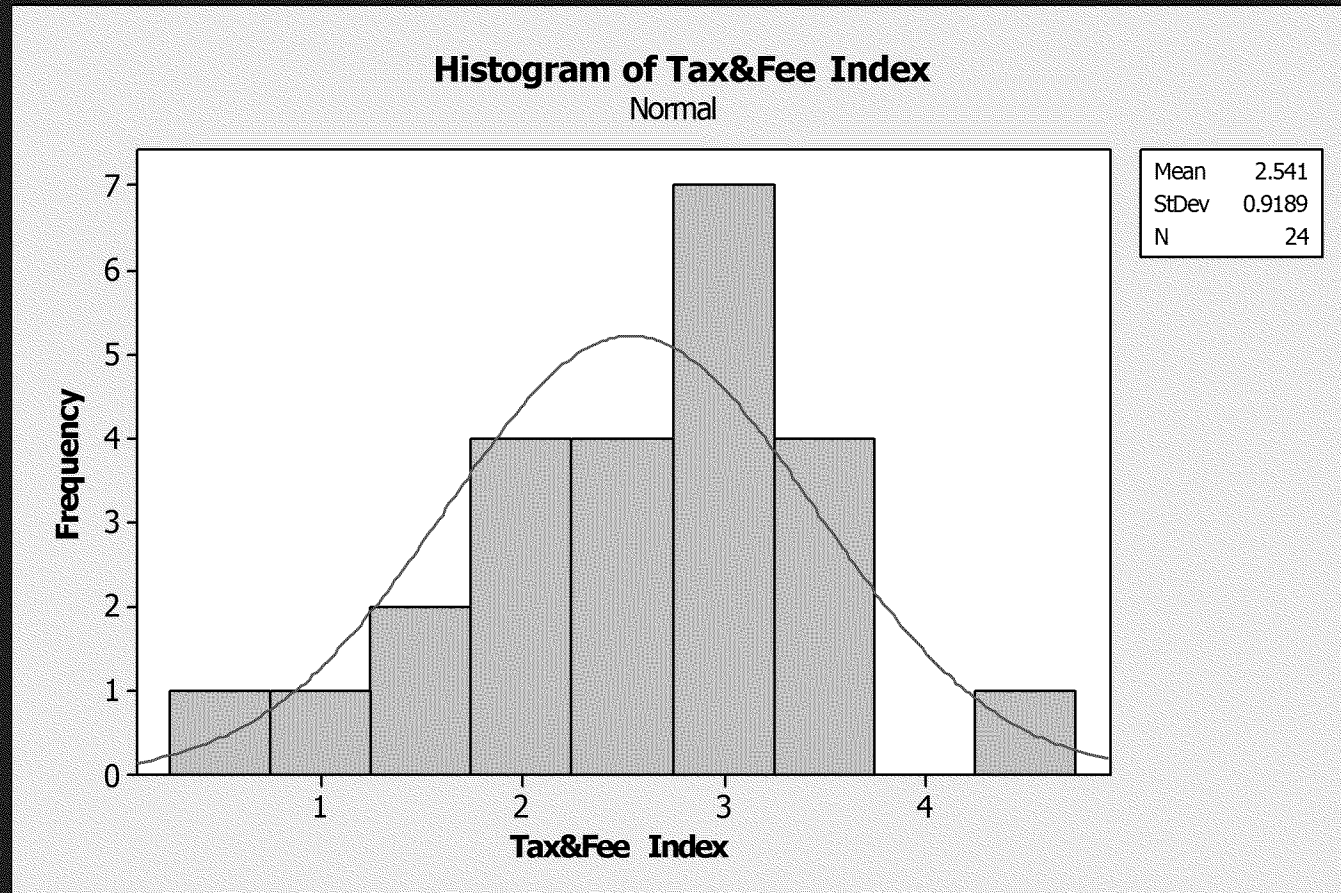
- Stratified Random Survey, 4 Community Sizes (by population)
 - ⌘ Large ($> 10,000$); Medium-large ($10,000-5,000$); Medium ($5,000-1,000$); and small ($<1,000$)
- To be selected, each community had to:
 - ⌘ Currently be meeting its MPDES permit, with a plant that was upgraded in the last 15 years
 - ⌘ Not be a nutrient-removal facility (only a few have been built thus far)
- For communities meeting the above criteria, individual communities from each population category were chosen using proportional allocation and random sampling ($n = 30$, total)
 - ⌘ Current per-user waster fee data were then collected and compared to the community MHI (2000 census, but updated to 2008 using a standard formula)

LMI Thresholds



- Weak (1): $< 62\%$
- Mid-Range (2): $62-33\%$
- Strong (3): $< 33\%$

Property Tax, Fees & Revenues Burden- Thresholds



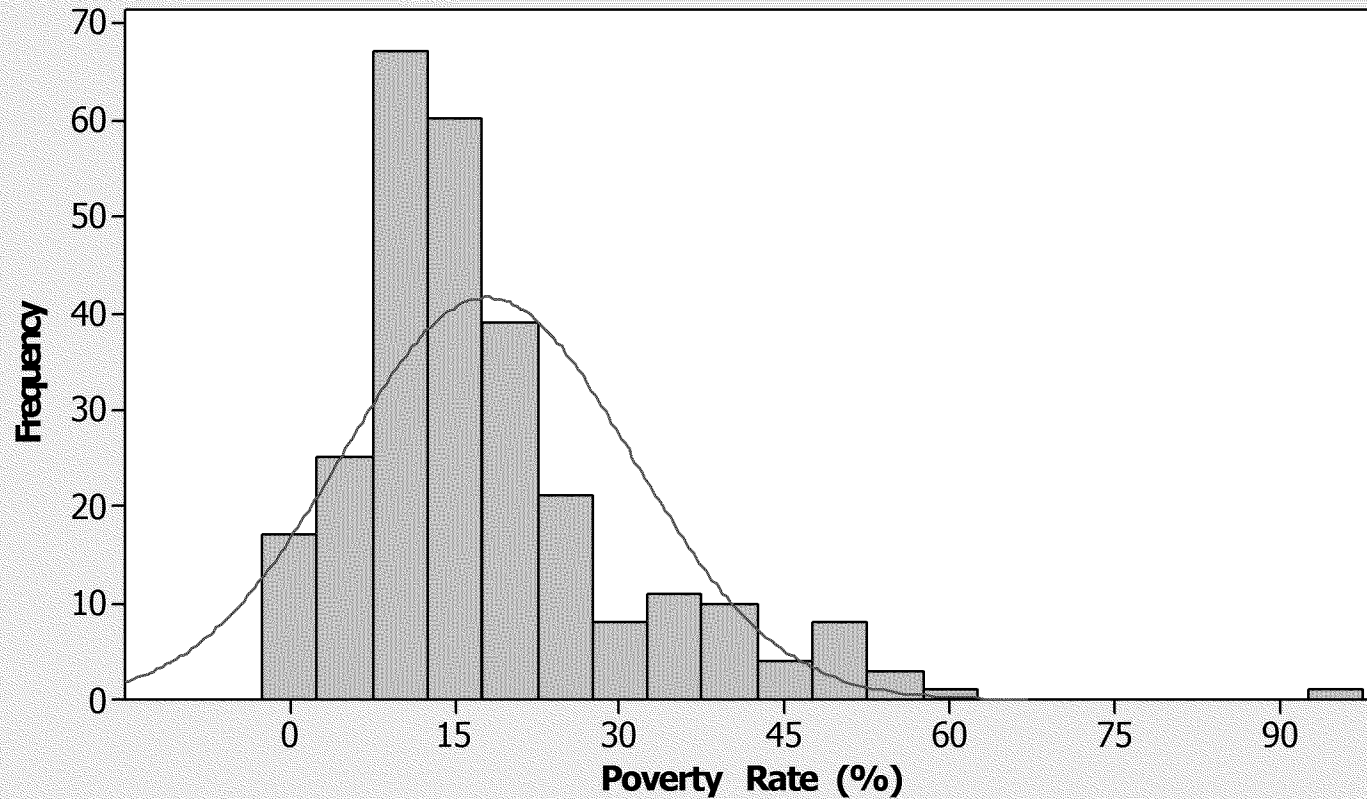
- Weak (1): >3.5
- Mid-Range (2): 3.5 to 2
- Strong (3): <2

- Data available for all communities in Montana
- Histogram based on 24 towns of all sizes distributed across state
- Index = (Total \$ Burden/MHI/population)* 100

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Poverty Rate by Montana Community

Normal



Recommended break points:

Strong (3): $\leq 10\%$

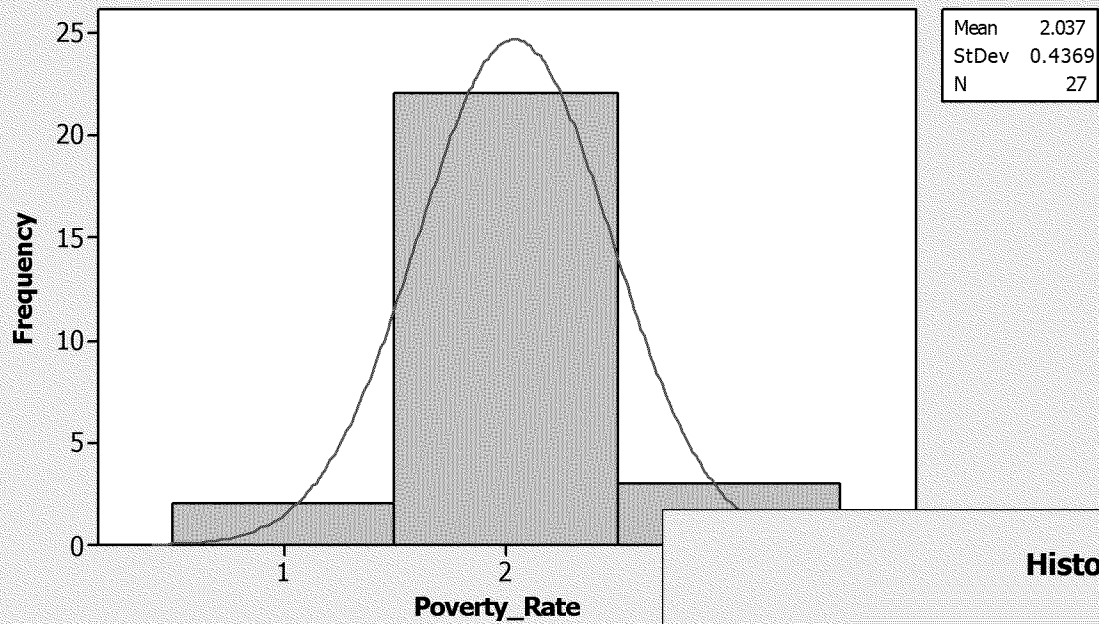
Midrange (2): 11-21%

Weak (1): $\geq 22\%$

Poverty Rate Data from Susan Ockart, Research Economist, Montana Department of Commerce

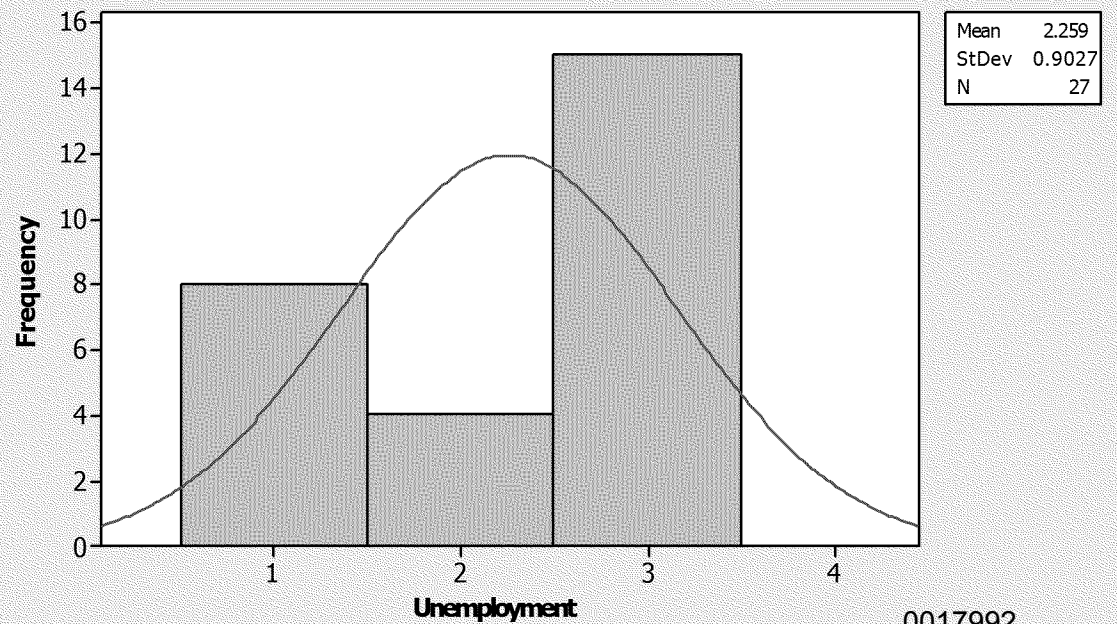
Histogram of Poverty_Rate

Normal



Histogram of Unemployment

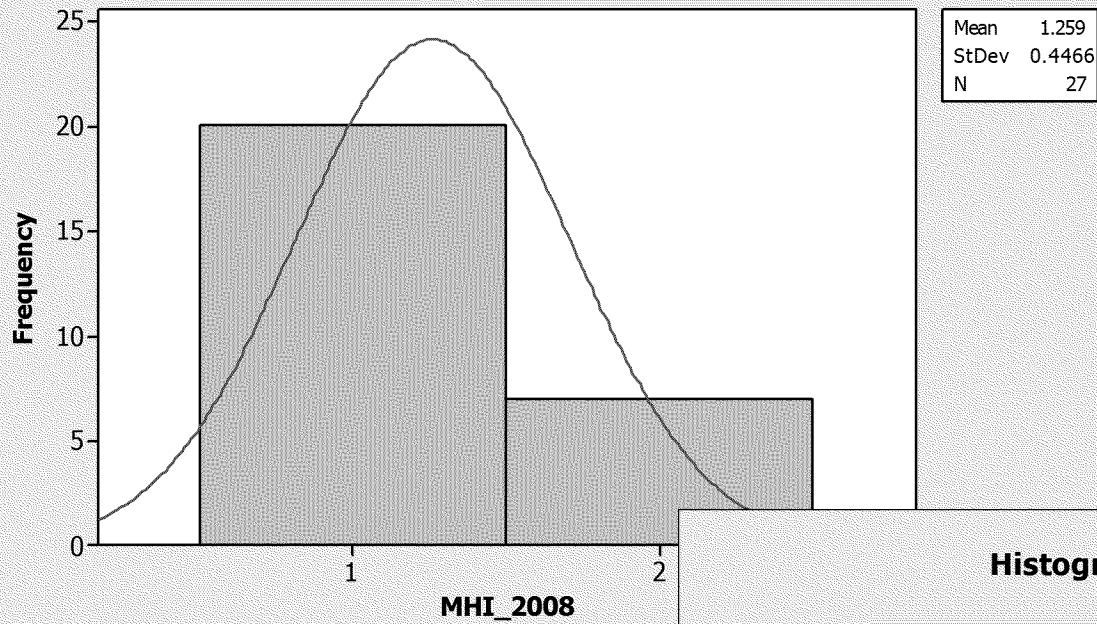
Normal



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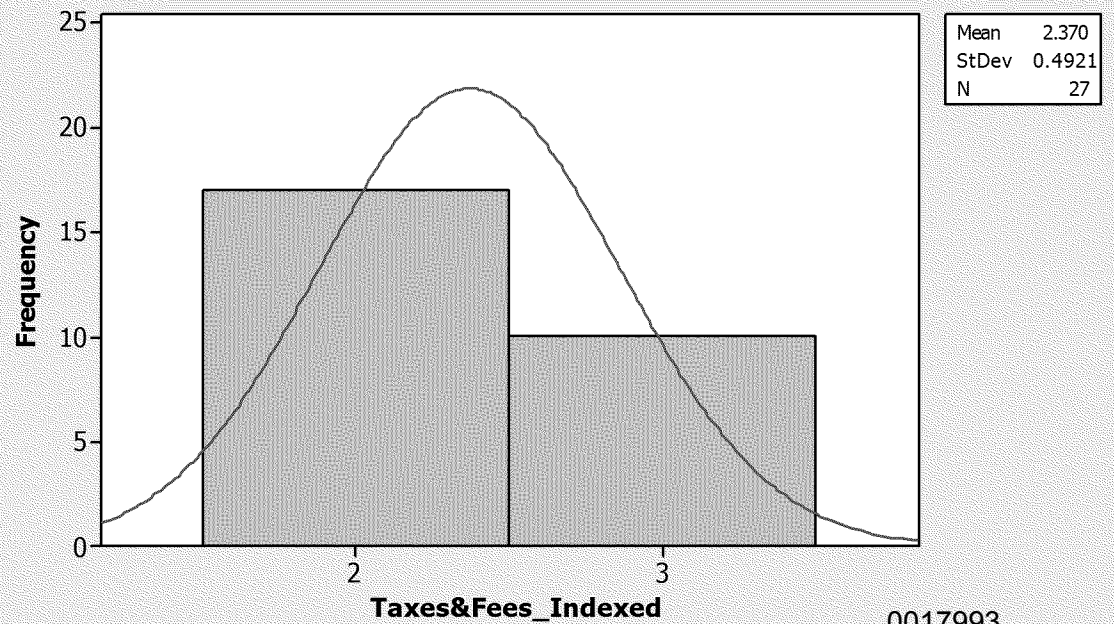
Histogram of MHI_2008

Normal



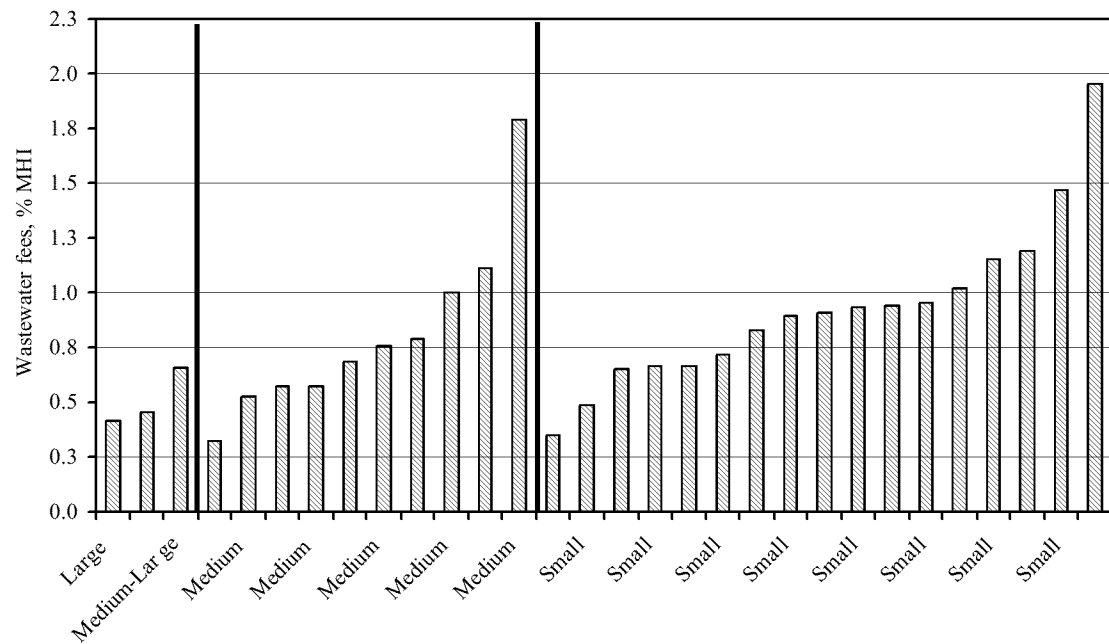
Histogram of Taxes&Fees_Indexed

Normal



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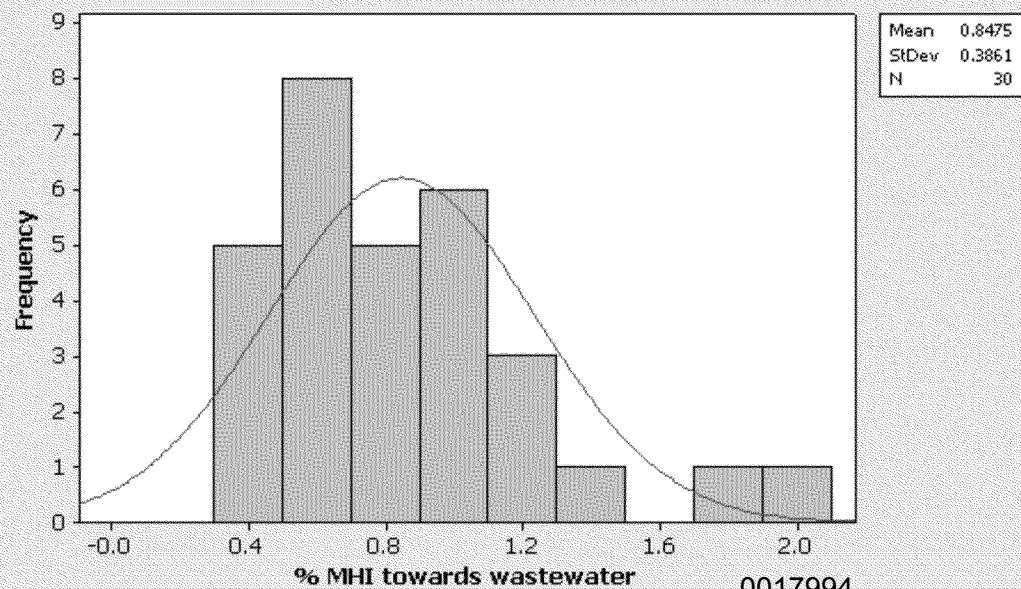
Current annual wastewater costs as a % MHI in Montana communities (n=30)



Town Size-MHI
distribution

Distribution of
MHI of current
wastewater fees

% MHI towards wastewater, surveyed communities (n=30)



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